G-LiHT Webmap: Over 100 Billion Laser Pulses Served

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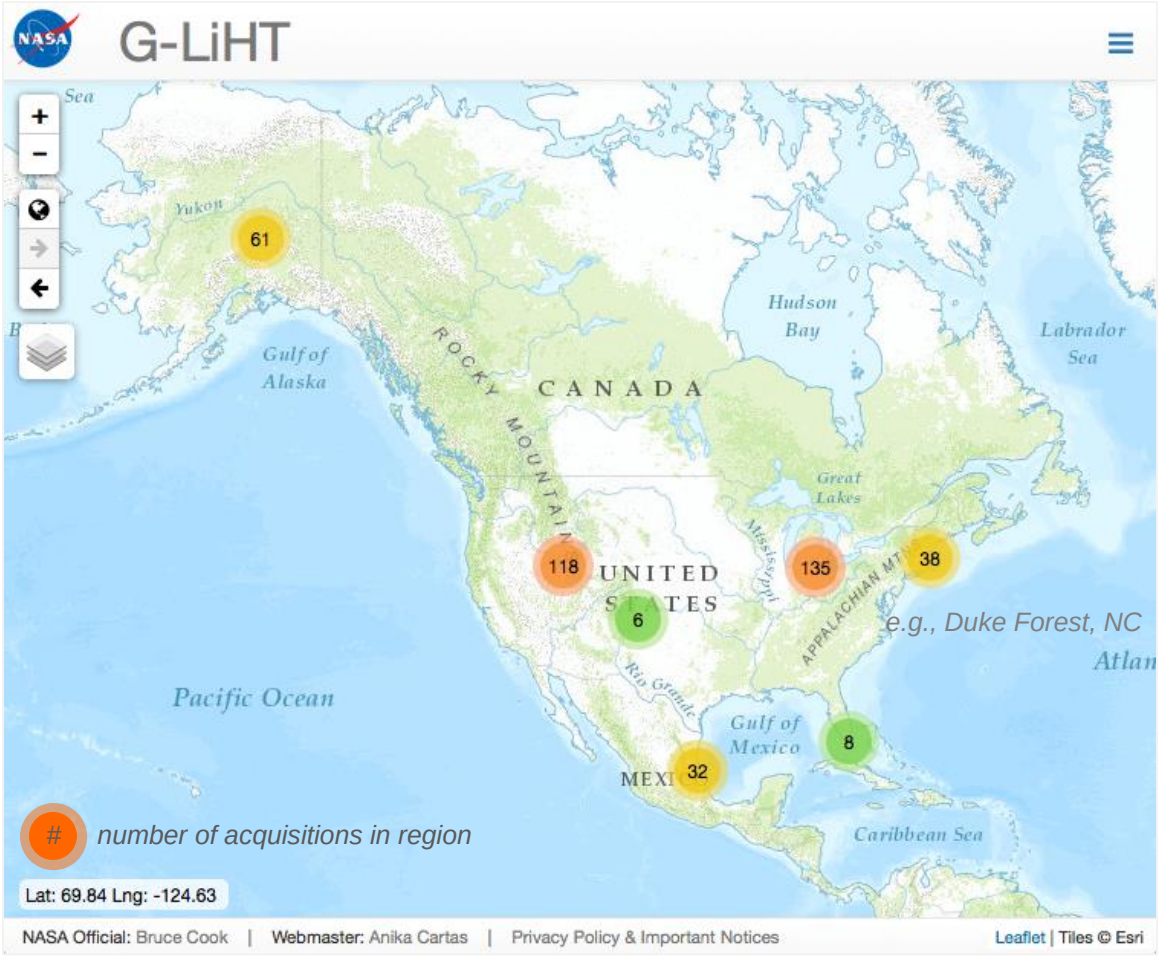
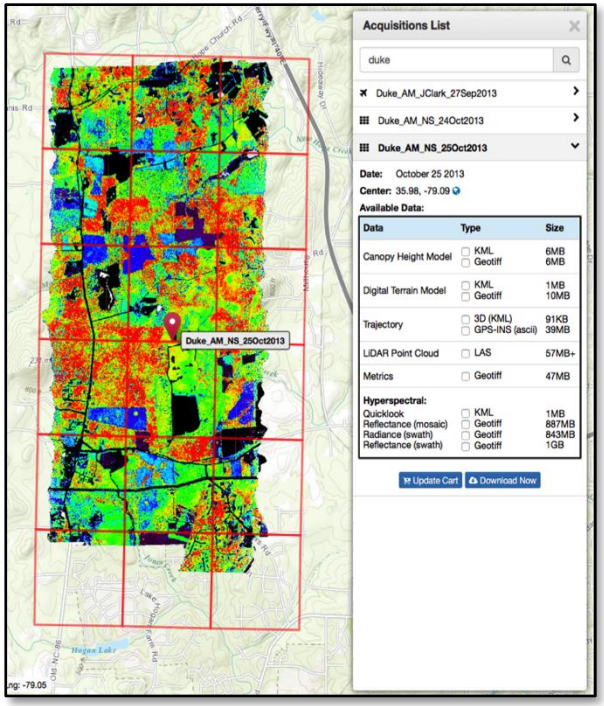
http://gliht.gsfc.nasa.gov



Preview and Data Selection Tool



A novel webmap interface developed by NASA GSFC Code 618 scientists provides ***open access to ~3 TB of user-friendly G-LiHT products*** for use by the larger science community and benefit of the public:

- Digital Terrain and Canopy Height Models
- 3D Lidar point clouds and statistical metrics
- VNIR radiance and at-sensor reflectance
- Radiant surface temperature

Goddard's Lidar, Hyperspectral and Thermal (G-LiHT) has collected ***multi-sensor airborne image data*** from Alaska to the Yucatan for ***NASA Missions*** and research funded through ***NASA ROSES, US Forest Service and Department of Defense***.

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References:

G-LiHT airborne system and data products:

Cook, B. D., L. W. Corp, R. F. Nelson, E. M. Middleton, D. C. Morton, J. T. McCorkel, J. G. Masek, K. J. Ranson, and V. Ly. 2013. NASA Goddard's Lidar, Hyperspectral and Thermal (G-LiHT) airborne imager. *Remote Sensing* 5:4045-4066. doi:10.3390/rs5084045.

Recent examples of other Earth Science studies enabled by open-access G-LiHT data:

Neigh, C., J. G. Masek, P. Bourget, K. Rishmawi, F. Zhao, C. Huang, B. Cook, and R. Nelson. 2016. Regional rates of US forest growth measured from annual Landsat disturbance history and IKONOS stereo imagery. *Remote Sensing of Environment*. 173:282-293, doi:10.1016/j.rse.2015.09.007.

Van Den Hoek, J., J. S. Read, L. A. Winslow, P. Montesano and C. D. Markfort. 2015. Examining the utility of satellite-based wind sheltering estimates for lake hydrodynamic modeling. *Remote Sensing of Environment* 156:551-560. doi:10.1016/j.rse.2014.10.024.

Duncanson, L., B. Cook, J. Rosette, G. Parker and R. Dubayah. 2015. The importance of spatial detail: Assessing the utility of individual crown information and scaling approaches for lidar-based biomass density estimation. *Remote Sensing of Environment* 168:102-112. doi:10.1016/j.rse.2015.06.021.

Hernandez-Stefanoni, J. L., K. Johnson, B. Cook, J. Dupuy, R. Birdsey, A. Peduzzi, and F. Tun-Dzul. 2015. Estimating species richness and biomass of tropical dry forests using lidar during leaf-on and leaf-off canopy conditions. *Applied Vegetation Science*, 18:724-732. doi:10.1111/avsc.12190.

Ni, W. K. J. Ranson, Z. Zhang and G. Sun. 2014. Features of point clouds synthesized from multi-view ALOS/PRISM data and comparisons with LiDAR data in forested areas. *Remote Sensing of Environment* 149:47-57. doi:10.1016/j.rse.2014.04.001.

Finley, A., S. Banerjee and B. D. Cook. 2014. Bayesian hierarchical models for spatially misaligned data in R. 2014. *Methods in Ecology and Evolution* 5:514-523. doi: 10.1111/2041-210X.12189.

Data Sources: Goddard's Lidar, Hyperspectral and Thermal (G-LiHT) airborne imager (http://gliht.gsfc.nasa.gov). Since 2011, G-LiHT has flown a total of ***952 flight hours*** (including short transits), recorded lidar returns from ***104 billion laser pulses***, and imaged ***20,482 km^2***. Acquisitions have included ***57,030 ICESat-GLAS footprints*** (45,878 CONUS; 11,152 Mexico); ***1,383 National Forest Inventory plots*** (895 CONUS; 190 Alaska; 298 Mexico); ***14 flux towers (***9 CONUS; 3 Alaska; 2 Mexico); **8 large stem map areas** (7 CONUS; 1 Alaska); ***24 sites with repeat lidar*** (18 CONUS; 4 Alaska; 2 Mexico); **Landsat 7 and 8 under flights** during commissioning; and ***characterization of pseudo-invariant calibration sites for EOS cross-validation***.

Technical Description of Figures: Screen shot of G-LiHT webmap showing distribution of acquisitions throughout North America (left), and selection tool (right) that permits users to preview acquisitions and select individual lidar, image spectroscopy products for downloading. These G-LiHT datasets were acquired to support NASA missions (e.g., ICESat, ICESat-2, Landsat, CLARREO, PACE); joint agency field campaigns (*e.g.,* ESA, USFS); and research research funded through NASA ROSES (Carbon Cycle Science; Carbon Monitoring System; Terrestrial Ecology), USFS (Forest Inventory and Analysis; Forest Health Protection), and DoD.

Scientific significance, societal relevance, and relationships to future missions: NASA airborne science data represents a public investment, and simplifying access to user-friendly products maximizes the return on this investment. G-LiHT's webmap and user-friendly data products allow the larger user community to find innovative uses for these data, and to address Earth Science questions both within and beyond the scope of the missions and projects that funded these acquisitions. The webmap interface was developed by scientists at NASA GSFC to serve the needs of G-LiHT and other Code 618 airborne instruments (i.e., DBSAR, EcoSAR), and will continue to benefit future Earth Science missions and research (e.g., GEDI, NISAR, ABoVE).